

"DESIGN OF VARIABLE STRUCTURE STABILIZER FOR A NONLINEAR MODE OF SMIB SYSTEM: PARTICLE SWARM APPROACH"

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ABSTRACT

In this paper, a particle swarm-(PSO) based variable structure stabilizer (VSC) is proposed for enhancing the dynamic stability of a nonlinear model of synchronous machine infinite busbar system (SMIB). Unlike the methods reported in the literature which involve either linearizing the model of synchronous machine around a suitable operation point or applying nonlinear transformation techniques before linear control theory is used in designing a fixed parameter PSS, the present method formulates the design of VSC as an optimization problem and utilized the PSO algorithm to provide a simple and systematic way of arriving at the optimal feedback gains and switching vector values of the stabilizer. When compared to previous methods, simulation results showed the effectiveness of the proposed stabilizer design.